

WHAT IS CLAIMED IS:

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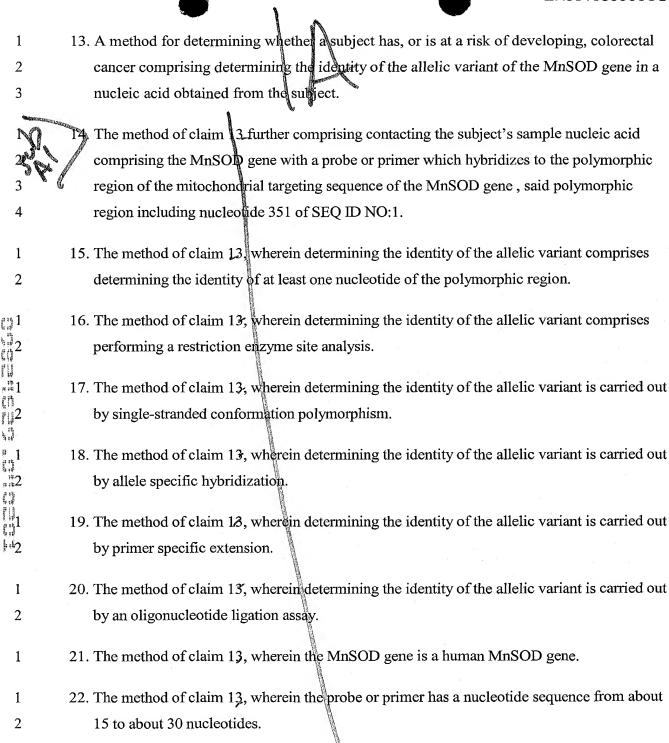
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- 1. A kit for determining whether a subject has, or is at risk of developing, colorectal cancer

 wherein said kit is used to amplify and/or determine the molecular structure of at least a

 portion of the MnSOD gene.
- 2. The kit of claim 1 further comprising a first and second oligonucleotide specific for SEQ ID NO: 1.
 - 3. The kit of claim 2 wherein said first and second oligonucleotides can be used to produce a polynucleotide comprising a region of the MnSOD gene, said region including nucleotide residue 351 of SEQ ID NO:1.
 - 4. The kit of claim 2, wherein the oligonucleotides have a nucleotide sequence from about 15 to about 30 nucleotides.
 - 5. The kit of claim 2, wherein the first and second oligonucleotides are labeled.
 - 6. The kit of claim 2, wherein the first oligonucleotide is specific for the MnSOD Ala allele and the second oligonucleotide is specific for the MnSOD Val allele.
- 7. The kit of claim 1' further comprising one or more oligonucleotide probes specific for the MnSOD Ala allele and the MnSOD Val allele.
- 1 8. The kit of claim 7 wherein said probes are detectably labeled.
- 9. The kit of claim 8, wherein said probes are fluorescently labeled.
- 1 10. The kit of claim 9 wherein said probes are labeled with a quenching molecule.
- 1 11. The kit of claim 7 wherein said probes are bound to a surface.
- 1 12. The kit of claim 1 further comprising an allele specific endonuclease.



- 23. The method of claim 13, wherein the probe or primer is labeled.
- 24. A method for determining risk of colorectal cancer in a subject, comprising the steps of:
 - a. determining the base identity of a portion of genomic DNA from the subject's cell

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sample, said genomic DNA comprising an MnSOD gene comprising a mitochondrial targeting sequence, said portion corresponding to position 351 as defined in SEQ ID NO:1 of said MnSOD gene in said mitochondrial targeting sequence; and b. correlating said base identity with a risk for colorectal cancer.

- 25. The method of claim 247, wherein the base identity of position 351 is determined by sequencing a portion of said mitochondrial targeting sequence of said MnSOD gene containing said position 351.
 - 26. The method of claim 24; wherein base identity of said position 351 is determined by digesting said portion of the mitochondrial targeting sequence of said MnSOD gene with a restriction endonuclease appropriate to determine the base identity of said position 351.
 - 27. The method of claim 24, wherein said base identity is determined by examining an RNA fraction from said subject's cell sample, whereby the identity of said genomic DNA at said position 351 can be determined.
 - 28. The method of claim 24 wherein a risk for developing colorectal cancer is assessed to be greater than that of the unaffected relevant population when the base identity at said position 351 is homozygous for C
 - 29. The method of claim 28; wherein the age of the subject is less than about 35 years.
 - 30. The method of claim 29; wherein the ethnicity of the subject is Hispanic.

